

CLAIMS

1. An ink refill system, said system comprising:

5 an ink source comprising a saturated zone;

a tubarc porous microstructure for conducting ink from said saturated zone to an unsaturated zone; and

10 wherein said ink is delivered from said unsaturated zone to said saturated zone through said tubarc porous microstructure, thereby permitting said ink to be harnessed through the hydrodynamic movement of said ink from one zone of saturation or unsaturation to another.

15 2. The system of claim 1 wherein said unsaturated zone is located within a printer cartridge linked to said ink source by said tubarc porous microstructure.

3. The system of claim 1 wherein said unsaturated zone comprises a
20 foam structure for maintaining said ink.

4. The system of claim 1 wherein said unsaturated zone and said saturated zone are located within an ink printer cartridge.

25 5. The system of claim 1 further comprising a pen that surrounds said saturated zone wherein a tip of said pen communicates with said tubarc porous microstructure, such that said tubarc porous microstructure conducts said ink from said ink source through said tip to said saturated zone located within said pen.

6. The system of claim 1 further comprising a pen in which said tubarc porous microstructure, said unsaturated zone and said saturated zone are co-located.

5 7. The system of claim 1 further comprising an ink pad comprising said unsaturated zone, wherein said unsaturated zone of said ink pad communicates with said ink source via said tubarc porous microstructure.

8. The system of claim 1 wherein said ink is reversibly transportable from
10 said saturated zone to said unsaturated zone and from said unsaturated zone to said saturated zone utilizing said tubarc porous microstructure.

9. The system of claim 1 wherein said ink is hydrodynamically transportable through said tubarc porous microstructure according to a
15 gradient of unsaturated hydraulic conductivity.

10. The system of claim 1 wherein said ink is conductible through said tubarc porous microstructure in a reversible longitudinal prevailing unsaturated flow.

20 11. The system of claim 1 wherein said ink is conductible through said tubarc porous microstructure in a reversible lateral unsaturated flow.

12. The system of claim 1 wherein said ink is conductible through said
25 tubarc porous microstructure in a reversible transversal unsaturated flow.

13. An ink refill system, said system comprising:

an ink source comprising a saturated zone;

a tubarc porous microstructure for conducting ink from said saturated zone to an unsaturated zone located within a printer cartridge linked to said ink source by said tubarc porous microstructure;

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wherein said ink is delivered from said unsaturated zone to said saturated zone through said tubarc porous microstructure, thereby permitting said ink to be harnessed through the hydrodynamic movement of said ink from one zone of saturation or unsaturation to another.

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14. The system of claim 13 wherein said unsaturated zone comprises a tubarc porosity for maintaining ink.

15. The system of claim 13 wherein said ink is reversibly transportable from said saturated zone to said unsaturated zone and from said unsaturated zone to said saturated zone utilizing said tubarc porous microstructure.

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16. The system of claim 13 wherein said ink is hydrodynamically transportable through said tubarc porous microstructure according to a gradient of unsaturated hydraulic conductivity.

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17. An ink refill system, said system comprising:

an ink source comprising a saturated zone;

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a tubarc porous microstructure for conducting ink from said saturated zone to an unsaturated zone;

a pen structure surrounding said saturated zone wherein said pin

includes a pen tip that communicates with said tubarc porous microstructure, such that said tubarc porous microstructure conducts said ink from said ink source through said tip to said saturated zone located within said pen; and

5 wherein said ink is delivered from said unsaturated zone to said saturated zone through said tubarc porous microstructure, thereby permitting said ink to be harnessed through the hydrodynamic movement of said ink from one zone of saturation or unsaturation to another.

10 18. The system of claim 17 wherein said ink is reversibly transportable from said saturated zone to said unsaturated zone and from said unsaturated zone to said saturated zone utilizing said tubarc porous microstructure.

15 19. The system of claim 17 wherein said ink is hydrodynamically transportable through said tubarc porous microstructure according to a gradient of unsaturated hydraulic conductivity.

20. The system of claim 17 wherein said ink is conductible through said tubarc porous microstructure in a reversible lateral unsaturated flow.